

### Claims

1. An arbitration method for selecting the connections to be made by a crossbar switch of a data switching system between a plurality of ingress ports and a plurality of egress ports, the arbitration method comprising:

- 5 (i) a request step of at least one ingress port transmitting one or more connection requests indicating egress ports to which a connection is required,
- (ii) a grant step of examining the connection requests, and, for each egress port for which there is a connection request, selecting one  
10 request for grant, and generating a grant signal indicative of the selected request; and
- (iii) an accept step of examining the grant signals and, for each ingress port for which there is a grant signal, selecting one grant signal to accept, thereby defining an ingress to egress port connection across  
15 the crossbar switch,

characterised in that:

the method employs, for each possible combination of an ingress port and an egress port, a respective weight value, a connection request only being selected in said grant step if the corresponding weight value is not zero;

20 and the method further comprises:

each time a connection is made in the crossbar switch involving an ingress port and an egress port, decrementing the corresponding weight value; and

in said grant step, if for a given egress port, there are no connection requests having non-zero weight values, the weight values are reset to default values before said selection.

2. A method according to claim 1 in which the default values for different  
5 respective weight values of at least one egress port are not equal.

3. A method according to claim 2 in which the default values are selected according to a desired statistical frequency of connections between specific ingress and egress ports.

4. A method according to Claim 1 in which in said grant step, each  
10 connection request is applied to a masking element having a working register whose contents are decremented by one each time a crossbar switch connection is made involving the said ingress port, the contents of the working register being used to mask the connection request generated by the ingress port when said contents are zero.

5. A method according to claim 4 in which said masking element further  
15 comprises a default weight register, programmed with the default weight to be allocated to said working register by a system control device, and said resetting comprises copying the value in the default weight register to the working register.

20 6. A data switching system in which a crossbar switch makes connections between a plurality of ingress ports and a plurality of egress ports, the system comprising:

request means for at each ingress port arranged to transmit one or more connection requests indicating egress ports to which a connection is  
25 required,

grant means for examining the connection requests, and, for each egress port for which there is a connection request, selecting one request for grant, and generating a grant signal indicative of the selected request; and

- 5 acceptance means for examining the grant signals and, for each input port for which there is a grant signal, selecting one grant signal to accept, thereby defining an ingress to egress port connection across the crossbar switch,

characterised in that:

- 10 the switch further includes, for each possible combination of an ingress port and an egress port, a working register storing a respective weight value,

- the working register is arranged to decrement each weight value each time a connection is made in the crossbar switch involving the corresponding ingress port and egress port, and, if there are no connection requests to a given egress port having non-zero weight values, to reset the weight values  
15 for the egress port to respective default values before selecting said connection request; and

the grant means only is arranged to select a connection request if the corresponding weight value is not zero.

7. A system according to claim 6 in which the default values for different  
20 respective weight values are not equal.

8. A system according to claim 6 in which said grant means includes for each combination of an ingress port and egress port a respective masking element including said respective working register, the contents of the working register being arranged to mask the connection request generated by the  
25 ingress port when said contents are zero.

9. A system according to claim 8 in which said masking element further comprises a default weight register, programmable with the default weight to be allocated to the working register by a system control device, and said grant means is arranged to reset the weight values by copying the value in the default weight register to the working register.
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10. A local area-switching network comprising a system according to claim 5.